Peptide T

Drug Class: **Entry and Fusion Inhibitors**

Drug Description

Peptide T is a modified octapeptide segment of the HIV envelope gp120. Peptide T is so named because of its high threonine content. [1]

HIV/AIDS-Related Uses

Peptide T is a selective entry inhibitor for HIV-1 isolates that use the CCR5 coreceptor.[2]

Discovered by researchers at the National Institute of Mental Health, peptide T was initially studied as a treatment for AIDS-related cognitive impairment and dementia. Studies from the mid-1990s had contradictory results. One study of nine HIV infected patients reported that patients who received high-dose peptide T had statistically significant cognitive improvement during the active phase of the trial, as compared to patients who received low-dose peptide T.[3] A second study reported no statistically significant difference in cognitive impairment between patients who received peptide T and those who received a placebo. However, upon further analysis, the data in this study indicated that peptide T may be associated with improved performance in a subgroup of patients with more pronounced cognitive impairment or higher CD4 counts.[4]

Peptide T has been previously studied as a treatment for distal neuropathy associated with AIDS. However, a study of 81 patients reported that peptide T had no benefit in reducing pain.[5]

Peptide T was shown to normalize nocturnal growth hormone secretion in two of three children with AIDS who received an IV bolus of peptide T.[6]

Currently, studies are evaluating the ability of peptide T to reduce the HIV reservoir in monocytes.[7]

Non-HIV/AIDS-Related Uses

Peptide T has been studied as a possible treatment for psoriasis.[8]

Pharmacology

Peptide T is a synthetic octapeptide derived from amino acids 185-192 of the gp120 V2 region of the HIV env gene. Peptide T selectively inhibits replication of HIV-1 strains containing the CCR5 cytokine receptor by directly blocking viral entry at this receptor.[9] [10] Peptide T also appears to act as a gp120 receptor antagonist, thus blocking viral infectivity and neurotoxicity.[11]

Monocytes in HIV infected patients can be reservoirs for HIV-1, especially in the CCR5-tropic viral strain.[12] In a study of 11 HIV infected patients, intranasal peptide T was administered three times daily for up to 32 weeks. Peptide T did not change the apparent plasma virus levels, but 5 of 11 participants had apparent CD4 count increases by 24 weeks of at least 33% relative to baseline. Peptide T treatment was associated with nearly complete suppression of active HIV replication in the circulating monocyte population.[13]

In vitro studies have not resulted in emergence of resistant mutations or escape viruses. However, in vivo resistance studies have not been performed.[14]

Adverse Events/Toxicity

No toxicities have been associated with peptide T administration in clinical studies to date.[15]

Clinical Trials

For information on clinical trials that involve Peptide T, visit the ClinicalTrials.gov web site at http://www.clinicaltrials.gov. In the Search box, enter: Peptide T AND HIV Infections.

Dosing Information

Mode of Delivery: Intranasal; intravenous.[16]

Dosage Form: Intranasal metered spray providing 0.4 ml per spray.[17] Studies in HIV infected patients have evaluated daily doses of 3 and 6 mg intranasal drug.[18] [19]

Peptide T

Chemistry

CAS Name: L-Threonine, N-(N-(N2-(N-(N-(N-(N-D-alanyl-L-seryl)-L-threonyl)-L-threonyl)-L-threonyl)-L-asparaginyl)-L-tyrosyl)-[20]

CAS Number: 106362-33-8[21]

106362-32-7[22]

Molecular formula: C35-H55-N9-O16[23]

C49.00%, H6.46%, N14.69%, O29.84%[24]

Molecular weight: 857.57[25]

Other Names

D-(alpha 1)-Peptide T-amide[26]

DAPTA[27]

D-Ala-Peptide-T-amide[28]

Further Reading

Polianova MT, Ruscetti FW, Pert CB, Tractenberg RE, Leoung G, Strang S, Ruff MR. Antiviral and immunological benefits in HIV patients receiving intranasal peptide T (DAPTA). Peptides. 2003 Jul;24(7):1093-8. PMID: 14499289

Redwine LS, Pert CB, Rone JD, Nixon R, Vance M, Sandler B, Lumpkin MD, Dieter DJ, Ruff MR. Peptide T blocks GP120/CCR5 chemokine receptor-mediated chemotaxis. Clin Immunol. 1999 Nov;93(2):124-31. PMID: 10527688

Ruff MR, Melendez-Guerrero LM, Yang QE, Ho WZ, Mikovits JW, Pert CB, Ruscetti FA. Peptide T inhibits HIV-1 infection mediated by the chemokine receptor-5 (CCR5). Antiviral Res. 2001 Oct;52(1):63-75. PMID: 11530189

Ruff MR, Polianova M, Yang Q, Leoung GS, Ruscetti FW, Pert CB. Update on D-Ala-Peptide T-Amide (DAPTA): A Viral Entry Inhibitor that Blocks CCR5 Chemokine Receptors. Curr HIV Res 2003;1(1):51-67. PMID: 15043212

Manufacturer Information

Peptide T
Advanced Immuni T, Inc.
P.O. Box 571
Liberty, NY 12754
(631) 584-4523

For More Information

Contact your doctor or an AIDSinfo Health Information Specialist:

• Via Phone: 1-800-448-0440 Monday - Friday, 12:00 p.m. (Noon) - 5:00 p.m. ET

• Via Live Help: http://aidsinfo.nih.gov/live_help Monday - Friday, 12:00 p.m. (Noon) - 4:00 p.m. ET

Peptide T

References

1. Merck Index - 2001; p. 1282

2. Peptide - 2003 Jul;24(7):1093-8

3. Am J Drug Alcohol Abuse - 1997 Nov;23(4):543-53

4. Arch Neurol - 1998 Jan;55(1):41-51

5. Neurology - 1996 Nov;47(5):1254-9

6. Peptide - 2002 Dec;23(12):2279-81

7. Peptide - 2003 Jul;24(7):1093-8

8. J Am Acad Dermatol - 1991 Oct;25(4):658-64

9. Peptide - 2003 Jul;24(7):1093-8

10. International Symposium on NeuroVirology - 6th, 2004. HIV Neuroprotection Workshop: D-Ala1-Peptide T-Amide (DAPTA) strongly suppresses HIV-1 replication in human primary macrophages and prevents HIV-1-related neuronal apoptosis. Available at: http://www.tinm.org/Aquaroetal.pdf. Accessed 12/22/04.

11. Curr HIV Res - 2003;1(1):51-67

12. International Symposium on NeuroVirology - 6th, 2004. HIV Neuroprotection Workshop: D-Ala1-Peptide T-Amide (DAPTA) strongly suppresses HIV-1 replication in human primary macrophages and prevents HIV-1-related neuronal apoptosis. Available at: http://www.tinm.org/Aquaroetal.pdf. Accessed 12/22/04.

13. Peptide - 2003 Jul;24(7):1093-8

14. Curr HIV Res - 2003;1(1):51-67

15. Peptide - 2003 Jul;24(7):1093-8

16. ClinicalTrials.gov - A Phase I Trial of Peptide T: Efficacy for the Neuropsychiatric Complications of Acquired Immunodeficiency Syndrome (AIDS). Available at: http://www.clinicaltrials.gov/ct/show/NCT00000393. Accessed 12/22/04.

17. Peptide - 2003 Jul;24(7):1093-8

18. Peptide - 2003 Jul;24(7):1093-8

19. Curr HIV Res - 2003;1(1):51-67

20. ChemIDplus - Available at: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp. Accessed 12/22/04.

21. ChemIDplus - Available at: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp. Accessed 12/22/04.

22. Merck Index - 2001; p. 1282

23. Merck Index - 2001; p. 1282

24. Merck Index - 2001; p. 1282

25. Merck Index - 2001; p. 1282

26. Neurology - 1996 Nov;47(5):1254-9

27. Peptides - 2003 Jul;24(7):1093-8

28. Peptides - 2003 Jul;24(7):1093-8